ILLINOIS TECHNOGRAPH

OCTOBER
1941

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Welcome Freshmen and E. C. M. A.

Campus Buildings

Use Die Casting

Good Music

Technocracked

ROTC Camp

Names in the News

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20¢

OCTOBER • 1941

This Issue . . .

THE TECHNOGRAPH

Staff . . .

MEMBER OF ENGINEERING COLLEGE MAGAZINES ASSOCIATED

Arkansas Engineer, Colorado Engineer, Cornell Engineer, Drexel Technical Journal, Illinois Technograph, Iowa Engineer, Iowa Transit, Kansas State Engineer, Marquette Engineer, Michigan Technic, Minnesota Techno-Log Missouri Shamrock, Nebraska Blue Print, New York University Quadrangle, North Dakota Engineer, North Dakota State Engineer, Ohio State Engineer, Oregon State Technical Record, Pennsylvania Triangle, Purdue Engineer, Rose Technic, Tech Engineering News, Villanova Engineer, Washington State Engineer, Wayne Engineer, Wisconsin Engineer.

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. . . bidding you a warm welcome to Illinois

THE NEW UNION BUILDING

Our Little Job As "Campus Greeter"

By Richard W. Landon

Senior in Electrical Engineering

RICHARD LANDON

The tall, dark and handsome Business Manager of the 1941-42 Technograph voices our welcome to all who come to the campus, and draws from the record items of interest for freshmen and delegates to the National Convention of Engineering College Magazines Associated. Soft-spoken humor underlies his serious analysis of the magazine's purpose.

Well, sir, school is here again. After the work and play of the summer, it seems like quite an oddity to be coming back to a regimented life of study for some ten months. But then, all play and no work makes Jack a dull boy—literally. Some of us have been merely playing this summer; others of us have been working; still others have engaged in activities as varied as life itself. So we come back and try to change our habits to those of concentration for a while at least.

But we can't stick to school work all of the time. The result—we indulge in extra-curricular activities. We find that though we learn fundamental principles of the why and wherefore in the classroom, there is no course that can adequately teach us how to work with the people around us. Activities, however, throw us with our fellows and rather force us into learning something about men's reactions, their likes and dislikes.

In the engineering college, the Technograph, the engineer's magazine, is such an activity and has grown through the years to a position of some importance. With the rise of this magazine and others similar to it in various colleges throughout the country, there came a need for an organization of these magazines whereby they could exchange ideas of editing and management. From this need was evolved the E.C.M.A.—Engineering College Magazines Associated.

The E.C.M.A. now includes twenty-four of the larger engineering college magazines and does much to maintain the high quality of these magazines. Inducements in the way of awards and prizes are offered for excellence in articles, editorials and make-up of the magazine. Such men as Professor Richardson, President of E.C.M.A., Mr. W. B. Littell, Advertising Representative, and John W. Ramsey, Executive Secretary, have done much to maintain the high standards and progressive spirit of the organization.

Every year, the organization holds a convention at some school among the twenty-four. Last year the convention was held at the University of Arkansas; this year it is to be held here on the campus of Illinois. Need we say that Illinois is proud to be host to such a group or that the students and faculty are glad to bring such representation into their midst. This group has done much in these conventions to present the ideas of all schools and from this heterogeneous collection evolve something for the benefit of both magazine and school.

The Technograph of Illinois is one of the oldest engineering college magazines in the country. Since its inception as a magazine in 1885 it has watched the University grow from a fairly small school to one of the largest universities in the world with schools renowned to the corners of the earth for their excellence.

It has watched the engineering college start from its beginnings as the first M.E. school in the middle west to develop into the massive organization it is today with some sixteen buildings and two hundred-fifty professors and instructors. The Technograph has reported engineering events during the development of the world famous Ceramics school, the splendid Architectural school, one of the finest Chemical schools, and an engineering curriculum second to none.

Since the days when freshmen engineers were forced to walk to and from classes through the refreshing waters of the Boneyard to the present day when the University frowns on any sort of hazing, the Technograph with the E.C.M.A. has been trying to express the engineers viewpoint, to show others just what engineering is. It's watched the fabulous Red Grange, Gallopin' Ghost of Illinois, tear through an opponent's line, and more recently Bill Hapac score against any defense.

The Technograph has looked across Green Street and seen Old Uni Hall go down and the erection of the splendid Illinois Union with its vast facilities for student entertainment. It's seen many a homecoming week end with the return of many alums and the resulting festivities. It's helped in Student Engineering Exhibits and Electrical Shows and aided generally in the advertisement of the engineering college.

The magazine has been serving its readers during the time for many men to pass from instructorship to professorship to oblivion or reverence; for students to leave to make their fame and fortune, some in engineering, some in many other lines of work. It's watched Arthur Cutts "AC" Willard pass from Dean of the engineering college to the presidency of the University. It's helped advertise the advancements made by faculty and students—to show public, students and faculty the truly great things that have been developed in the University such as the "placing of sound on film," accelerating electrons, development of workable bridge formulae, and other developments too numerous to mention.

The Technograph as other magazines in the E.C.M.A. tries to give the student, primarily, faculty and alumni, secondly, news of the engineering campus, developments in and outside of the school, with a dash of wit and humor

OLD *and* NEW

Changes in the campus scene noted in the TECHNOGRAPH of past years included these buildings:

The Memorial Stadium (top) was erected in 1922-23 as a gift of alumni and friends of the University through the Athletic Association. It replaced the old Athletic Field (left) as the scene of most varsity interscholastic contests.

Center of military activity and instruction at the University is now the Armory (left) which was built in 1914-15 and was supplemented by additions in 1926-27. This structure replaced the Old Armory (bottom) which had been erected in 1889-90. The latter has been used as the Old Gym Annex since its retirement from military service.

thrown in for good measure. The Technograph has deviated from the other magazines to a certain extent in the past year, however, in developing an easy style of familiarity with the student. It is the belief of the Technograph staff that while students are interested in subjects beyond their own scope, they do not care to delve into a scientific discussion of the fabrication of refractory products when they are interested in the "why" of magnetic attractions. Thus most articles about the technical subjects are treated more as news than as technical treatises. Prominent people are presented with a view towards giving the engineer a better acquaintance with his college. (We believe this is undoubtedly the best feature of its kind on the campus.—Ed.)

The Technograph also has as its aim help for the new engineer; acquainting him with faculty, students and buildings; helping him to decide on the proper engineering courses, and in general, to develop in him a sense of just what an engineer is. All phases of engineering are presented; none are shirked, and all are praised equally.

To help advertise the college and what it stands for is its final purpose. To high schools and other colleges goes the magazine to show what Illinois is doing, to promote the college. Engineers wield the most potent forces in the world, but it takes advertising to get people to allow the engineer to use his abilities.

The staff of the Technograph is proud to be able to present this magazine of the students to the students and hopes that through the ensuing months it may present such articles as will be of greatest interest to all engineers. The Technograph invites your criticism and suggestions and will endeavor to put them to good use. We welcome you—whether you be a freshman, upperclassman, E.C.M.A. delegate, professor, or alumnus, and may you find the Technograph of 1941 good reading.

Let DIE CASTING

Solve Your Non-ferrous Casting Problems

The necessity of obtaining economical castings in quantity for National Defense focuses attention on fabrication by the die-casting process. The author presents a resume of the possibilities.

By M. Hufschmidt

Among the various processes used for fabricating metals, die casting has continued to be used to an ever increasing degree. This is due to some inherent advantage that it possesses when compared with ordinary sand casting or permanent mold casting. As a result the process has grown so that now die castings are used in a great many industries; their most important application is in the automobile and aircraft industries.

Die casting is essentially casting molten metal under pressures greater than atmospheric. For this purpose metallic molds are used. The molten metal is forced under pressure into the steel molds and allowed to cool. The molds are then parted and the completed castings removed. When taken out and examined the surfaces are found to be very smooth and free from sand inclusions and blowholes. Thus they require little or no machining, and can be used immediately, or treated by painting, buffing, or plating. Very complicated parts can be die cast; multicored castings can be made if a suitable mold can be designed, because the molten metal penetrates every part of the mold, and imparts a very sharp and finished appearance to the castings.

The die casting process is capable of producing metal parts fit for a great many uses. It is restricted to metals of comparatively low melting points. Zinc, aluminum, and magnesium are the most important metals being die cast, although brass is also being die cast in spite of its high melting point. There are no rigid size restrictions to their production; articles as small as zipper teeth and as large as automobile radiator grilles are being produced today. The present trend is molding castings, formerly consisting of many parts, as one piece, thereby saving the cost of fitting.

There are several limitations to die casting which are retarding its full development, but which are being solved by research and experiments. As a result many difficulties have already been overcome. As previously mentioned one limitation is the high melting point of some of the alloys. The steel dies now in use are not able to withstand the temperatures needed to melt some alloys; hence an improvement in die steels will result in further development of brass die casting.

Another difficulty encountered was the change in chemical composition of the alloys between melting and the finished product. Iron was being absorbed from the melting pot; this iron reduced the tensile strength and ductility of the castings so its presence in the casting was very objectionable. The molten metal was also absorbing oxygen and nitrogen from the compressed air which was in direct contact with the casting metal. This also caused the castings to be full of small air pockets, which further weakened the metal. The pouring temperature also was not high enough to keep the metal molten until it reached the furthest point in the mold. The use of low pressures in casting resulted in castings with rather low metallic densities.

The cure to most of these difficulties has been found. Improved melting pots reduce the absorption of iron by the metal. Higher pressures and new machines using the pneumatic-ram principle solve the density and air pocket problems, by removing the contact between the compressed air and the molten metal. This almost entirely removes the oxygen and hydrogen absorption. Machines have been designed to die cast aluminum at pressures around 9,000 pounds, thus improving the metallic density.

The zinc die castings are of importance in the automobile industry, where the castings are used for many parts both on the motor and the body. The castings can be produced at a low cost, because of quantity production. They have good tensile properties up to about 200 degrees Fahrenheit, but above that temperature their strength falls off rapidly. The auto industry uses about one-half of all the zinc die castings produced; this ratio has remained constant for the past ten years. The total zinc die castings production has increased four-fold in the last ten years however, showing an expansion of their use in all fields.

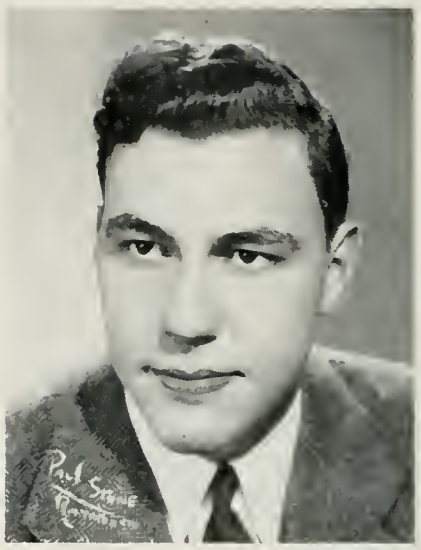
Aluminum alloy die castings are being used much in the aircraft industry today; their properties make them suitable for use as unstressed and semi-stressed members. A disadvantage still noticed is their unfavorable elongation properties; this prevents them from being used in many spots where elongation is an important factor. Die casting has saved aircraft companies much money in the past. As much as $2,000 was saved on a single plane by using die castings, while savings of 15% of sand casting and machining costs are usual.

The latest in die casting alloys are the magnesium alloys. Their distinctive feature is their extreme lightness. Magnesium is but two-thirds as heavy as aluminum, and one-fourth as heavy as steel. Although not as strong as aluminum or steel per unit volume, they have favorable mass-strength ratios when compared with them. As a result magnesium die castings are used for secondary stressed and non-stressed members on aircraft. The Dowmetal alloys EX, K, and R are samples of aluminum alloys being die cast. When machining is necessary, the magnesium alloys possess the additional advantage of machining very easily.

Brass die castings possess very good physical properties; they are resistant to corrosion and have values of tensile strengths up to 100,000 pounds per square inch, and hardnesses up to 200 Brinell. Their high melting point is the main factor restricting their production. The improvement in design of dies will overcome this difficulty.

The technical advances made in the last few years have definitely put the die casting process in an increasingly important position in industry, especially in the aircraft and auto industries. The development of new high-pressure automatic machines, which turn out die castings by the thousands, results in a lower unit cost, and thus a wider range of use. It is true that die castings are limited to non-ferrous metals of reasonably low melting points, but within these limitations the process has a great opportunity for expansion. It is the hope of the die casting industry that in a few years die casting will replace many parts now sand cast.

Engineers Appreciate Good Music Too . . .



CHARLES G. SCHOTT

A thorough understanding of music comes only from hearing it frequently. The best in music is presented by the Star Course, for which the author is Senior Manager. As an engineer he speaks from the engineer's viewpoint.

By Charles G. Schott
Senior in Mechanical Engineering

I have often heard it said that the engineer cannot understand anything other than figures and his pet slide-rule. Being an engineer myself I cannot think of any statement which is farther from the truth. However, since I have been associated with the Star Course I have noticed that only a few of our engineering students seem to possess the *understanding* necessary to appreciate good music. This is one of the very few failings which the group seems to possess, but stop and think! How many other people have that *understanding?* Relatively few!

The engineer, the same as the lawyer, the accountant, artist, or chemist, does not have that so-called understanding simply because he has not *exposed* himself long enough. If you had never come in contact with a few engineering principles or seen an engineer at work, you probably would have chosen another field in which to apply your potentialities. But you had heard of engineering many times. Perhaps your friends were interested in the vocation or your parents had an active part in it. You had been *exposed* and now you have attained through education an *understanding* of engineering.

Your understanding of music must grow the same way. An understanding of music is not developed over night, acquired from textbooks, nor is it picked up in a classroom. Music is something which grows on a person. Music is something which lives because of its own greatness. Music is the something which continues to live after man dies. Such a thing as this must be worthwhile.

Behind every classical piece of music written there is a story. "What kind of a story?" you may ask. It may be either a story portraying some incident of life, or it may be a story of the composer's emotions. Beethoven, Tchaikowsky, Haydn, and Debussy all wrote in both gay, light moods and extremely passionate ones. Knowing this background and the life of the composer will add to your understanding of each number. It is through knowing these facts that you will know what the composer is trying to display through his music. When you know what to expect you can appreciate the manner in which the work is written and presented. You can criticize and applaud—in fact you may *understand* the music. From your understanding you may then competently express your special likes and dislikes. And let there be no doubt—everyone has his special likes and dislikes about all music.

To the freshman, who desires to expose himself to this thing called music, Star Course offers a wonderful opportunity, not as a commercial organization, but as an activity of which he can be a part. He will work with music, meet the people behind it, and gain a wealth of musical information. Star Course is sponsored by the University Concert and Entertainment Board and it is in his first year the freshman may apply to them for a position on the sophomore staff. The sophomore staff is composed of fifty students, twenty-five boys and twenty-five girls. Sophomore work consists mainly of handling the office work, concert presentation, and publicity. After the sophomore year if the student wishes to go on he may apply to the board for a position as Junior Manager. Here the responsibilities increase. The Junior Managers have charge of or supervise all the work carried out by the sophomores and are responsible for the completion of such work. For your last year in school, if you were successful in being appointed a Junior Manager, you may petition for the position as Senior Manager.

Each semester Star Course presents a series of concerts for the students and faculty of the University at a nominal cost. These concerts are presented throughout the year in the Auditorium of the University. This year we are inaugurating a new system of concert presentation in celebration of our fiftieth anniversary. In the past it has been the custom to present the artists in a single Star Course series, and then to supplement this series with a Symphony Course. Now we are presenting a single series each semester which places our organization on a running basis similar to the University year.

In celebration of our fiftieth anniversary we are giving a complimentary concert to our first semester patrons which will feature the celebrated Coolidge String Quartet. It is our hope that the entire University will join us in this fiftieth anniversary celebration.

In the past few years I have had several students, freshmen as well as upperclassmen, ask me just how Star Course did get its start on the campus. It's a long story and it all started in the spring of 1917 when the University Concert and Entertainment Board was organized under the name of Star Course. It had a board of advisers consisting of the director of the School of Music, the comptroller, a member of the faculty selected by the Council of Administration with a view to acting in an advisory capacity concerning dramatic attraction, and two members elected annually by the Philomathean and the Adelphic Literary Societies. The comptroller was selected to be ex officio chairman of the board and the faculty members were to serve for two years. The managers were selected from each literary society for each season's course.

(Please see page 22)

Left: At 6:00 A.M. the shadows are long and you are very sleepy, but the top-kick says "Battery B on the line;" Bob Johnstone (center) and Ralph Clark (right) both have that sleepy look. Center: The 3-inch AA gun recoils with a bang at Ft. Sheridan, where coast artilley cadets from Illinois trained at summer camp. Right: You tell us who is who when wearing gas masks for gas and smoke drill on the beach at Ft. Sheridan.

Oh, for the Life of the Army!

This letter is the first of several intercepted from the R.O.T.C. camps this past summer. Watch for the one to follow in the November issue of the **Technograph**, which the Editor promises is "a Lulu." The identity of "Darling" is not disclosed.

Company D, ROTC Camp
Fort Custer, Mich.

To whom it may concern,
Darling,

Sometime about the middle of June a group of tents sprang up on what had been a deserted field here at Fort Custer. In a few more days dull-colored Army trucks began hauling supplies to this section. On June the nineteenth the components of the ROTC camp began to pour in. Regular officers and non-commissioned officers from many schools arrived a few days early to complete final preparations for the organization of the camp. When the students arrived, by train, bus, car, etc., they were hauled to the camp, unloaded, registered, and sent to take their physical examinations. Having passed the physical exam, and very few didn't pass, they were issued equipment and assigned to tents.

The first big problem to be settled was the placing of equipment in the tents. Some thirty-five or forty separate articles and pieces of equipment had to be adjusted and put away in accordance with camp regulations. Within the first few days each man knew where everything should go and had become accustomed to placing it there. It isn't at all like home, Darling. The process of learning this placement was somewhat speeded up by numerous tent and area inspections. Gee, they are more strict than your housemother!

Camp duties began immediately after the equipment had been issued. The rifles were all packed in wooden cases, ten to a case, and each rifle was carefully and individually packed in several pounds of cosmoline. Cosmoline is a peculiar sort of grease which has the property of drying and leaving a hard varnish-like surface which is almost impossible to remove. Cleaning this grease from the rifles required gallons of gasoline, many men, and a great many hours of hard work. After completing this preliminary cleaning the grease kept oozing from the cracks whenever the gun stocks became warm. The rifles did not attain good condition for several days. Mine is slick as a whistle now.

The beginning of our actual instruction was more in the line of review and orientation than an effort to learn something new. For the first few days the time was occupied with close order drill, extended order drill, setting-up exercises, general instructions in camp rules and regulations, and final adjustment of all the myriad details connected with starting an organization such as this. Darling, they really made us work. Wasn't that mean?

The fourth day of camp we took up the packing of the army haversack and bed roll. (Did ya' ever see a bed *roll*, huh?) The general idea is to take all the essentials for a march of several days and so pack them together as to be readily accessible and comfortable to carry. The equipment carried included a blanket, shelter half (one half of the standard army pup tent,) tent poles and stakes, toilet articles, items of clothing such as a raincoat, change of underclothing, extra socks, mess equipment, canteen, and emergency food supplies. The complete army pack weighs approximately sixty-five pounds, more than half as much as you do. When it is properly packed and adjusted to the body of the soldier it is not especially uncomfortable or difficult to carry. That's what they *told* me anyway.

Extended order drill and instruction in general combat principles and scouting and patrolling occupied several hours of each day for the last half of the first week. During the progress of this instruction we made several short hikes of a few miles each practicing the various principles we were being taught.

The principle and most important instruction given during the first two weeks of camp is that given concerning rifle, sighting and aiming exercises, position exercises, practice in making the various slings for the rifle, practice in bolt manipulation and rapid fire exercises. At the conclusion of this preliminary instruction we were taken to the rifle ranges for actual firing practice. In the firing of a thirty calibre rifle the first shot is the hardest. All of us had heard so many tales concerning the recoil or "kick" of the rifle that we were more or less jittery when taking position for firing our first shots. Actually, the recoil is not bad at all. The explosion of firing the projectile is rather painful to the ear drums if the ears are not stuffed with cotton, but otherwise firing the "thirty" is no more difficult than firing the "twenty-two" calibre rifle on the University rifle ranges. I'll bet you'd have jumped too,

darling, if you heard the noise these make.

During the practice firing we fired at ranges of two hundred and three hundred yards, using all four positions, standing, sitting, kneeling, and prone, using slow fire in all positions and rapid fire in kneeling, sitting, and prone. At the conclusion of this practice period, which required about four days to complete, all cadets fired a record course in an attempt to qualify with the rifle as marksman, sharpshooter, or expert. Maybe I'll get a medal you'll like—and be a *crack-shot* instead of a *crack-pot* like Uncle thinks I am. He won an iron cross or something.

One of the more interesting side line jobs in connection with the range practice is the pit detail. This is a group of men who leave the camp about twenty minutes before the firing crew and take up positions in pits just below the range targets. These men operate the targets, mark the position and value of all hits scored, time the exposure of the targets for rapid fire, and any other duties in connection with keeping the targets ready for firing. They receive communications from the firing line through private telephone systems, one for each detail of ten or twelve targets, operated by various members of the organization.

All in all, the range firing is a lot of fun, but it gets extremely hot and the light is quite blinding on a bright day. The firing line is of sand, and when it is dry and the wind is blowing, the eyes get rather rough treatment. Protective glasses are almost a necessity. I'm getting a good sunburn.

Meals are provided by the company mess. In our organization—the Engineers, about one hundred twenty-three of us are fed in our mess hall, plus about twenty-five men from the Signal Corps. Nine men are delegated each day to serve as K. P.'s. They clean up the mess hall, wash all the dishes and silverware, and make themselves generally useful in preparing the meals. The actual food is not of especially high quality in some cases and is quite often unattractively prepared, but on the whole, the food is good enough and in large enough quantities so that a man can live on it and remain healthy. In many cases the men seem to put on weight at camp.

As to recreation, we have the whole city of Battle Creek, which is not especially well supplied with recreation, we have our own ROTC Club or Hostess House, athletic facilities are available for swimming, tennis, horseshoes, volleyball, and other such sports. In addition the Post movies are available for us and show quite good features. The USO provides shows every once in a while. They are usually of good quality and quite entertaining. I have seen only one of them, but it was excellent. Gee, I wish you were here, too.

Religious facilities are afforded by both the many churches in Battle Creek, and the various post chaplains. Services are held every Sunday morning and many of the men attend regularly. In general, the facilities are available for almost anything a person wishes to do, all you have to do is find out where it is.

As soon as we finish our rifle training we will take up the more technical engineer field problems, such as mining and demolitions, bridge construction, road construction, etc. We are all looking forward to that period with a great deal of pleasure. And I'm looking forward to seeing you before we go back to Illinois this fall—it'll be so different from the Army.

This should give you some idea of what our first ten days are like here at the ROTC Camp. I must close now and get ready for the work tomorrow. I'll write again soon. Lebewohl—Gerry.

The November issue of THE TECHNOGRAPH will emphasize military and national defense industries. Watch for it.

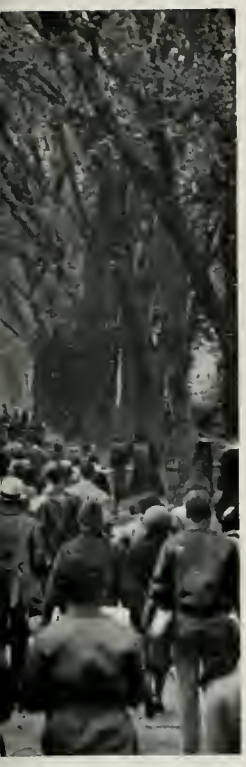
O N O U R

Above: Engineering Hall is the landmark for engineering alumni who return to the campus. The Engineering College and the Technograph are among those offices quartered within its buff brick walls.

Below: Huff Gymnasium, named for the late George Huff, famed Athletic Director at the University, is the scene of major dances in between duties as host to record-breaking basketball crowds.

Top Center: You are now among
the Broadwalk in the rush betwe
the north and south portions of th
becomes Burrill Avenue.

Bottom Center: As the hub of st
Illini Union Building sparkles lik
the front of Engineering Hall.



CAMPUS

Above: The Registrar, Physical Plant Department, President, Dean of Men, and Business Office are among the many offices in the Administration Building. Your university record and probably your life history are in the files.

Below: Illinois is proud of its library, one of the largest in the country, and the building which houses well over a million volumes is a good example of modified Georgian architecture.

ini who traditionally have crowded
ses. The Broadwalk ties together
pus. On the engineering campus it

affairs and social activity the new
em in this night scene taken from

NAMES

. . . *in the news*

By Richard W. Landon
Senior in Electrical Engineering

and Donald K. Stevens
Senior in Ceramic Engineering

BOB KUDER

Bob Kuder, senior EE, walks around the engineering campus with a continual smile and possesses the ability to make everyone like him better each time they meet him. Bob doesn't try to be likable; it just comes naturally. Partly because of this affable manner, he has been twice elected to the vice-chairmanship of the student branch of the American Institute of Electrical Engineers. Here he has done an admirable job in directing meetings, planning programs and helping in the publication of the noted "Campus Currents."

Bob lives not far from the campus in a turn of the highway near a bridge designed by some Illinois engineers. He lovingly refers to this budding metropolis as the Golden Gate of the Midwest, St. Joseph. As it's only ten miles from the campus, he drives to school every day. Living away from school doesn't keep Bob from attending the meetings of the various organizations to which he belongs including Eta Kappa Nu, honorary electrical engineering fraternity, and Sigma Tau, honorary engineering fraternity. And it's a lot of fun to get a ride home once in a while when Bob's along with his car. Funny how many people flock around Bob at the time to leave one of these meetings.

Women don't bother Bob a whole lot. Not that he won't stand outside of the Engineering Hall for fifteen minutes to see a certain little red-head pass by, but he is able to think of things engineering once in a while—judging by an excellent grade average. He hasn't managed to go gaga over anything on the campus as yet, but there's a certain little miss in Decatur that causes him to spend a good many Friday nights in driving to and from a little session with her.

BERT FOWLER

Bert hails from Centralia, came to Illinois because it was handy and has since made the kind of grades we all dream about; the kind you and I wish for but seem to eternally elude us. When we asked Bert his formula for getting good grades we were nonplussed. "Study as little as possible and have a date every night. I've averaged about six dates a week since I've been down here." From now on we're going to burn our books and never go to bed.

Bert is a member of Sigma Tau, honorary engineering fraternity, Pi Mu Epsilon, honorary math fraternity, and Tau Beta Pi, the Phi Beta Kappa of the engineering campus. He being a P. E., or rather an Engineering Physicist, is also a member of the Engineering Physicists Society.

Bert went into Engineering Physics because he found out that there is where one is offered many methods of obtaining simple solutions by long, hard, roundabout methods. It also gives him a chance to use a lot of figures, calculus summation figures, and Greek symbols that no one can understand. The basis of all this is that if you can fool the consumer into thinking you are going to a lot of work to perform such a feat as counting the lines of magnetic force in a piece of iron or counting by hand the number of inch-pounds to the fourth power to make certain moment of inertia, you can get a lot of money more easily than if you merely got the answer by a straight-forward method.

Bert and his roommate, Bob Ballard, make a great pair for a laboratory team except that a certain li'l Southerner by the name of "Alabam" is very prone to enter the conversation. They have been known to argue for fifteen minutes over her parting remarks.

PAUL FLUCKE

Paul came to Illinois from the Junior College of Kansas City, Missouri, after plunging through a Physics course down there that's guaranteed to keep sixty per cent of its enrollment from continuing with engineering pursuits. Paul managed, and possessing a deep interest in chemistry, he came here where he'd heard was one of the world's finest chem schools. He was right.

He's an independent, likes the same things you like, including the ever-popular female; God bless 'em. He didn't date much during the first semester of last year making up for lost time on those infrequent trips home, but now . . . We heard that Paul once got into hot water when he had two dates with two different girls set for the same night. We've often wondered how he got out of that.

Paul is now president of the student branch of the American Society of Chemical Engineers and also a member of the Engineering Council which he is endeavoring to help in its purpose of engineer promotion. Paul is all for the engineer and if he has anything to do with it, the engineer is going to get a greater share in the publicity of the school. The engineer is rightfully a member of one of the most powerful of the student groups, thus he should share in some of the glory.

We leave Paul, make-no-cracks-about-my-name, Fluke to his test tubes and retorts till we again see him in the Union Building some quiet evening with some lovely thing draped on one arm.

GERRY HOMANN

That solidly handsome chap in the military uniform is one Gerald William Homann, Cadet Colonel, civil engineer, scholar, activity man, and holder of more medals, prizes and awards than any Illini since the Boer War. Gerry is every inch a soldier and with it all has the ease of a general. Mattoon is responsible for his up-bringing and still proudly claims this sandy-haired, square-jawed peer of the R.O.T.C.

It's almost disheartening to the rest of the class when Gerry pulls down five-points in C.E., and none of his Tau Bete brothers would be sorry to have his high scholastic three year average. But concrete masonry and bridge truss stresses are only one phase of a many-faceted career. He's active in the "Y" and is on its board. The *Technograph* had an Alumni Department under his direction two years ago. He's a Ma-Wan-Da man and serves on the Military Council. But there is no doubt about it—military is his first love.

As captain of Pershing Rifles this year Gerry played host to the National Assembly of Pershing Rifles in August and has high hopes and aspirations for the Illinois company's future. Twice the individual champion in drill at regimental drill meets and winner of the Hazelton Medal and University Gold Medal in successive years, Gerry does not boast of his achievements.

Where the women are concerned Gerry is a one man Panzer division. Even his close friends can't tell whether he is true to a queen from Decatur, or the various belles from Knoxville, Springfield, and Pumpkin Center. He's a good dancer, clever conversationalist, and believe me, anything can happen in his presence. It will be interesting to see who he dates for the Military Ball—or is that putting him on the spot?

TECHNOCRACKED . . .

By Donald K. Stevens
Senior in Ceramic Engineering

•

In the fall a young man's fancy turns to what he has been thinking about since spring. And that's not such a bad idea at all when one knows that the strain is proportional to the stress. Illini co-eds return to their usual haunts about this time, eager to display a case-hardened suntan and a reading knowledge of world affairs. Smooth upperclassmen and their more gullible younger brothers are ready to dodge studies and summer bill-collectors for another nine months. It's just like "one big happy family" except that the family is at war. Or haven't you heard about the popping across the pond?

And then there is that usual accumulation of army gags, most of them too stagnant for presentation here. But we did hear of the Lieutenant who said "no" to the Colonel. That was twelve years ago and he is still a Lieutenant. He hadn't heard about the sign painter who wasn't paid. Reason: he painted "Private" on the General's door.

There is the sad epitaph on the grave of a selectee—"He can't tell me what to do even if he is the sergeant." The war will definitely end in December. A fellow who never has held a job over three months was drafted the first of September.

Among the News Items:

From Fort Bragg, North Carolina, comes word that a dreamy gunner confused the girl friend's telephone number with the range elevation. Somehow the Army is asked to pay for a cow and three turkeys.

A prisoner sentenced to Sing Sing for 99 years has asked for parole because he doesn't want to be confused with a naval base. I wonder if he has considered trading off with some other parolee who is over-age. Wouldn't that destroyer?

The ordnance company who captured the tanks in maneuvers had the right idea. Smoke and tear gas won where rifles and light hand grenades could not. Doesn't that bring a tear to your eye? It did to the tank crew.

It's too bad that Lt. Gen. Ben Lear cracked down on yoo-hooing. We could have disguised intelligence officers as yoo-hooers for foreign service.

Your local draft board might defer you for work on the *Technograph* this year. It's a good activity y'know, and no one will question the value of a little magazine work for the up and coming engineer. The staff may select you for service, and if they do, the men behind the *Technograph* will find the army draft a breeze by comparison.

From *The Bridge* of Eta Kappa Nu comes a daffynition of electricity that even "Buck" Knight doesn't know. Since nobody knows exactly we can't say it's wrong anyway:

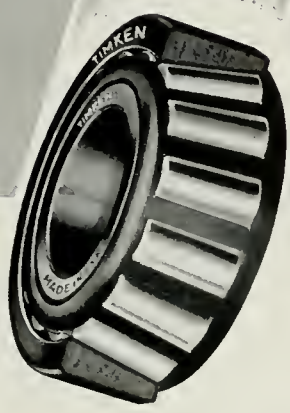
It burns your toast;
It shreds your shirts;
It pulls off buttons
And drives you nerts.
It scorches your hair;
When you need it most
It isn't there.

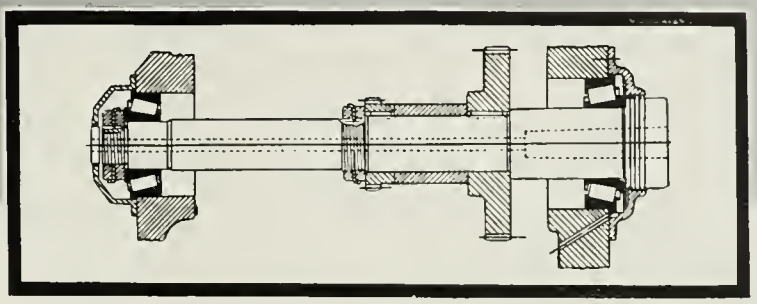
It blows a fuse;
The burner goes off,
And you catch a cold:
A six-months' cough.
In the summertime
The ice box quits,
The food is all spoils.
And the Missus has fits.

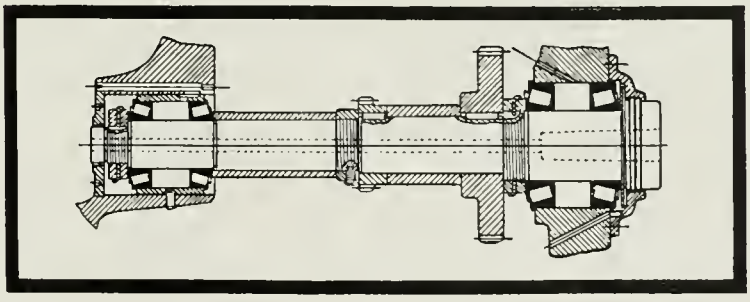
In the wintertime
Your car won't start,
The battery's frozen
As a loan shark's heart,
Again you find
Your battery dries,
Your lights go out
And your motor dies.

All of which is another way of saying that electricity is that which flows in wires, if there are any, if there is any of it.

What bearings would you specify for a Machine Tool Spindle?







Suppose you were designing a heavy-duty lathe for precision work—where tolerances as close as one ten-thousandth of an inch had to be held; where heavy cuts would be the rule. How would you mount the work spindle?

If you knew your bearings you would mount the spindle on TIMKEN Bearings front and rear. Then you would be assured of permanent spindle rigidity; freedom from chatter under any cutting load; any spindle speed; any rate of feed. In other words, *accuracy*. The spindle would turn smoothly because there would be no friction to hamper its movement. Power demands would be lower. Radial, thrust and combined loads would be carried safely under all operating conditions.

By following the above procedure you would be doing what an overwhelming majority of the leading heavy-duty machine manufacturers have been doing for a long time.

If you would like to know more about the application of TIMKEN Bearings in all kinds of machine tools as well as in many other kinds of equipment write for a free copy of the Timken Reference Manual. Know your bearings—be a better engineer.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

Manufacturers of TIMKEN Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; TIMKEN Alloy Steels and Carbon and Alloy Seamless Tubing; and TIMKEN Rock Bits.

TIMKEN
TAPERED ROLLER BEARINGS

GUESS WHAT?

Up on the wilds of the engineering campus behind the E.E. Lab. is a most curious fountain. I'm not kidding. A circular wall as high as a freshman's head and 25 feet in diameter (slide-rule approximation) surrounds a square column of tin which projects about five feet above the rim. From this column pours a perpetual stream of fooey green water which rushes to the bottom and maintains several feet of liquid within the walls at all times.

What is this aquatic shrine or thing-amajing? Nobody in the vicinity seemed to know exactly, 'cause I got some very queer answers. The four-foot wire fence above the wall is evidently to keep something out. The large pipe encircling the wall just inside the fence smacks of big industry. Certainly it is nothing an L.A.S. man would know anything about.

Some say this fooey fountain is supposed to purify water and that the green stuff inside is on tap in all the engineering buildings—huh, huh—that's not for me. The stuff doesn't look too good to drink. Still, in a fountain it might look pure, and taste is no criterion down here.

Perhaps it's an eternal spring some engineer once tried to harness and failed; there are several disconnected fittings about. But then, that's just another theory. It appears we haven't gotten to the bottom of the solution.

This is the place you come in—or go out—or both. Cast your critical eye on the gadget the next time you pass that way. Write a few accurate descriptive lines properly describing this fooey fountain—why and what it is—and for the best description the winner will receive a free subscription to this year's new Technograph. The judges' decision is final and a duplicate prize will be awarded if necessary. To get to the point—what is the fooey fountain?

What do you know about electricity?

Check the correct answers to the questions below and see how many of these Westinghouse engineering activities you know

LIGHTNING EXPERIMENT

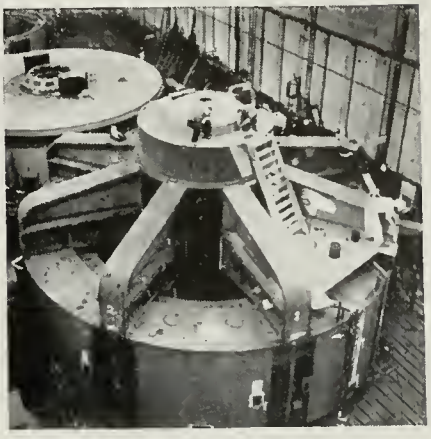
Recently, a Westinghouse engineer sat in his car while a 3,000,000-volt bolt of artificial lightning struck it. He was safe because the car body acts as:

1. *A Helmholtz bell*
2. *A Faraday cage*
3. *A Maxwell's demon*
4. *A Wilson cloud chamber*

MASS SPECTROGRAPH

This mass spectrograph, used by engineers at the Westinghouse Research Laboratories, performs one of these functions:

1. *Sorts atoms according to mass*
2. *Reveals spectra of stars*
3. *Produces U235*
4. *Measures amount of oxygen in air*



BIGGEST GENERATORS

Pictured above during construction is one of the three largest water-wheel generators in the world. All three are Westinghouse-built. Each will produce 108,000 kva, and is made for:

1. *Boulder Dam*
2. *Passamaquoddy*
3. *Dnieperstroy*
4. *Grand Coulee*

MECHANICAL MAN

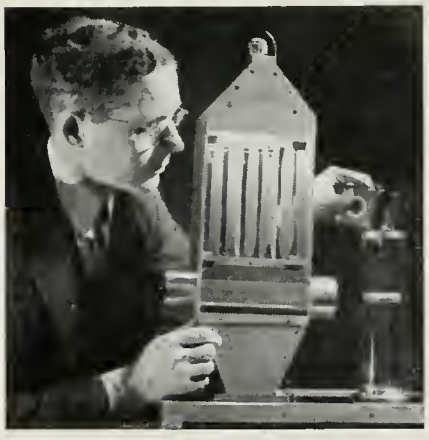
This is the latest of a series of mechanical men made by Westinghouse engineers. He walks, talks, smokes cigarettes, raises his arms, counts on his fingers, distinguishes red and green lights. His name is:

1. *Volto*
2. *Mephisto*
3. *Elektro*
4. *Sambo*

FAST X-RAY

Westinghouse research engineers have developed a motion-stopping X-Ray that operates in:

1. *200th of a second*
2. *40th of a second*
3. *100,000th of a second*
4. *1,000,000th of a second*



PRECIPITRON

The Westinghouse Precipitron removes 95% of the solid matter from the air, including particles as small as pollen, microscopic dust, and smoke. It works by:

1. *Law of inverse squares*
2. *Capillary action*
3. *Infiltration*
4. *Electrostatic attraction*

HOW DID YOU DO?

Here are the answers. If you got 4 out of 6 of these Westinghouse activities right, you did O.K. If you got 5 out of 6 right, you deserve a cum laude. If you got all of them right, you're amazing.

Westinghouse

"THE NAME THAT MEANS EVERYTHING IN ELECTRICITY"

Lightning Experiment . . . A Faraday cage
Mass Spectrograph . . . . . Sorts atoms according to mass
Biggest Generators . . . Grand Coulee
Mechanical Man . . . . Elektro
Fast X-Ray . . . 1,000,000th of a second
Precipitron . . . Electrostatic attraction

FOR FRESHMEN ONLY . . .

New Illini in the class of 1945 will find the usual perplexing problems of registration and orientation first on their docket. To the end of proper registration and avoidance of complications Dean Jordan suggests that the budding engineers "take things as they come and follow directions." Most difficulties of sectioning and filling out the long study lists will arise from students who try to take unusual courses, get certain instructors, and otherwise attempt to "be different." The best advice is to pay attention to signs and verbal instructions, and no "cure all" is advertised or available.

Among the many suggestions offered by upperclassmen for the benefit of the new registrants are the bits of wisdom included below. "Take care of your coupon sheet for Freshman Week." Duplicates are available only with difficulty from the Dean of the College. "It's wise to take in the many events listed—the lectures for mechanical details of the registration procedure, the mixers and dances for the people you meet. Remember that you will be in school with these fellows for the next few years, and need we mention the value of meeting the beautiful (?) Illini girls." You will all be facing the same problems and opportunities, and surely the recreation will be worthwhile. The upperclassmen will want to use your tickets for the social affairs, and that should be just one more reason for you to use the coupons instead of letting them have all of your fun, according to some far-sighted advice.

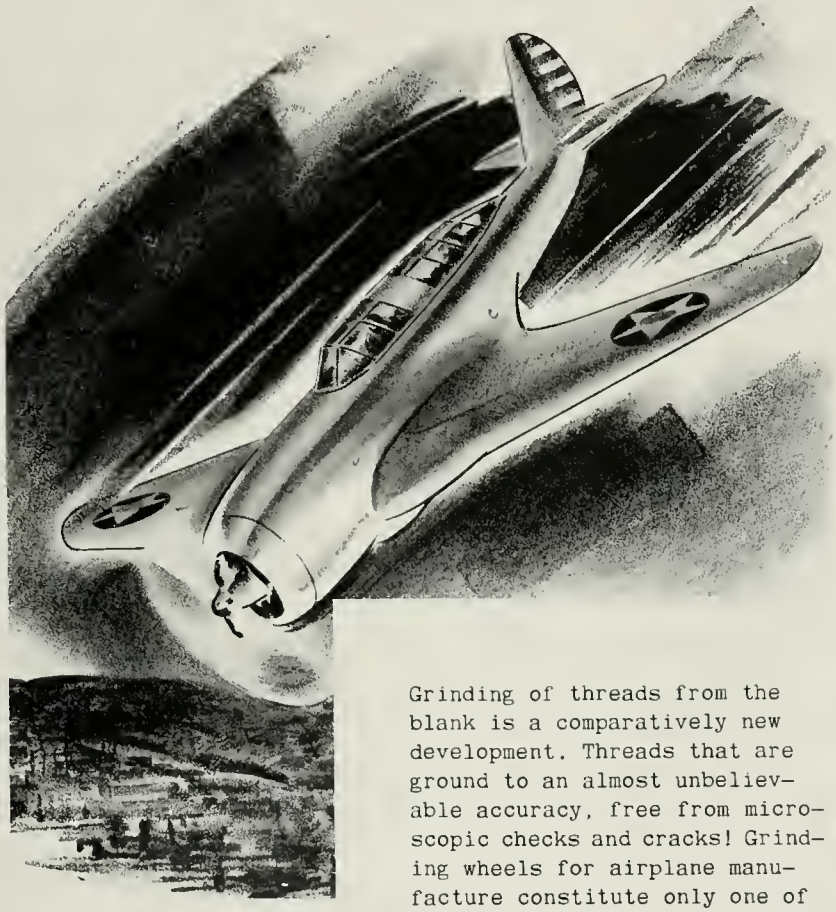
Do you know the head of your department? Some time within the next several weeks it would be entirely proper for you to introduce yourself to him at his office or on the street. Even President Willard will be glad to welcome you to his office—and he's an engineer too, so you will have common ground for conversation. Don't hesitate to speak to the society presidents when they are pointed out to you. Gerald Homann, the Cadet Colonel, is a civil engineer and he won't mind a bit if you introduce yourself to him. Donald Stevens and Richard Landon, Editor and Business Manager, respectively, of the *Technograph*, will surely be glad to meet you. All of these people will be anxious that you get off to a good start.

Naturally advisers speak of studies. They say "It would be hard to impress upon you too much the fact that the first eight weeks are most important." After all, we are all here to get a little preparation for engineering, and the advice of many engineers is "get off to a good start and you are more likely to follow through."

The usual remarks are made with regard to activities among the upperclassmen interviewed. Most of them advise the new engineering students to broaden themselves by a few well-chosen activities, and athletics, music, publications, and military are pointed out as good fields for extra-curricular interests. The Activity Night program during Freshman Week is a good opportunity to glimpse the multitude of activities available at Illinois.

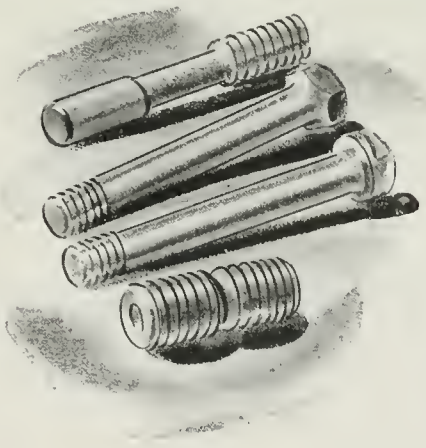
Next to the registration procedure the questions of room, board, and part-time work are usually most numerous. The Dean of Men's office is best qualified to answer any such questions which have not already been covered in the pamphlet "Your First Year at Illinois." (The latter publication is available without charge in the Information Office of the Administration Building.) During fraternity rushing the advantages of fraternity life are presented to rushees, and MIDA points with pride to its growing program of service to independents. Hence the upperclassmen and facultymen say it's up to you Mr. Engineer, to listen and then make your own decisions.

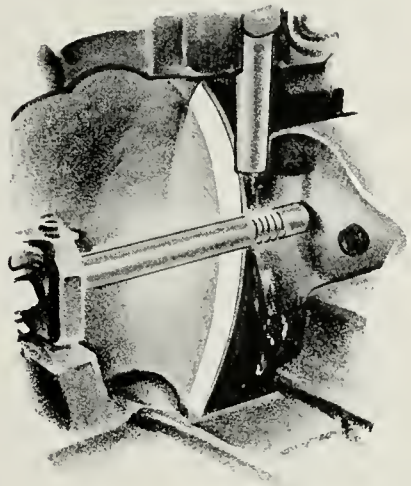
What holds a dive bomber together at 500 M.P.H.?



The answer is design and construction and materials and craftsmanship. But accuracy and finish of parts are also important in building a plane to withstand terrific speeds and that depends on grinding. Vibration is minimized by grinding all moving parts of the power unit to extreme accuracy. Safer and stronger threaded parts are ground with special grinding wheels such as are made by The Carborundum Company.

Grinding of threads from the blank is a comparatively new development. Threads that are ground to an almost unbelievable accuracy, free from microscopic checks and cracks! Grinding wheels for airplane manufacture constitute only one of many contributions made to industry by Carborundum during its fifty-year existence.





In fact there isn't an industry that has not been benefited by grinding. No matter what industry you go into after graduation, you may run into a grinding problem. And Carborundum Engineering Service will be ready to help you solve it! The Carborundum Company, Niagara Falls, New York.

CARBORUNDUM
REG. U.S. PAT. OFF.
ABRASIVE PRODUCTS
50 YEARS OF SERVICE
TO ALL INDUSTRY

"Carborundum" is a registered trade-mark of and indicates manufacture by The Carborundum Company

ENGINEERS APPRECIATE MUSIC

. . . from page 8

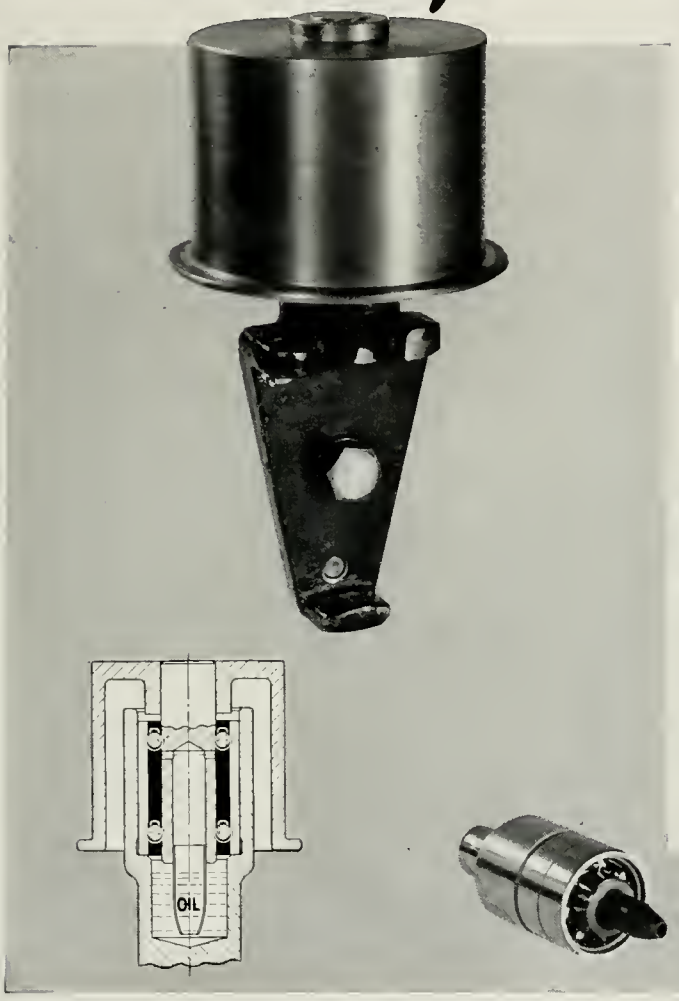
In 1929 the University Concert and Entertainment Board was created to take over the Star Course and its related activities. The function of this board was to supervise all concerts and public entertainment given in University buildings wholly by professional artists, lecturers, orchestras, and other professional individuals and organizations. The membership of the board was changed to four faculty members and four students. This board was also instrumental in electing a senior student manager for each year and such junior managers and sophomore assistants as were considered desirable. In 1933 the board elected a senior woman to assist as associate manager.

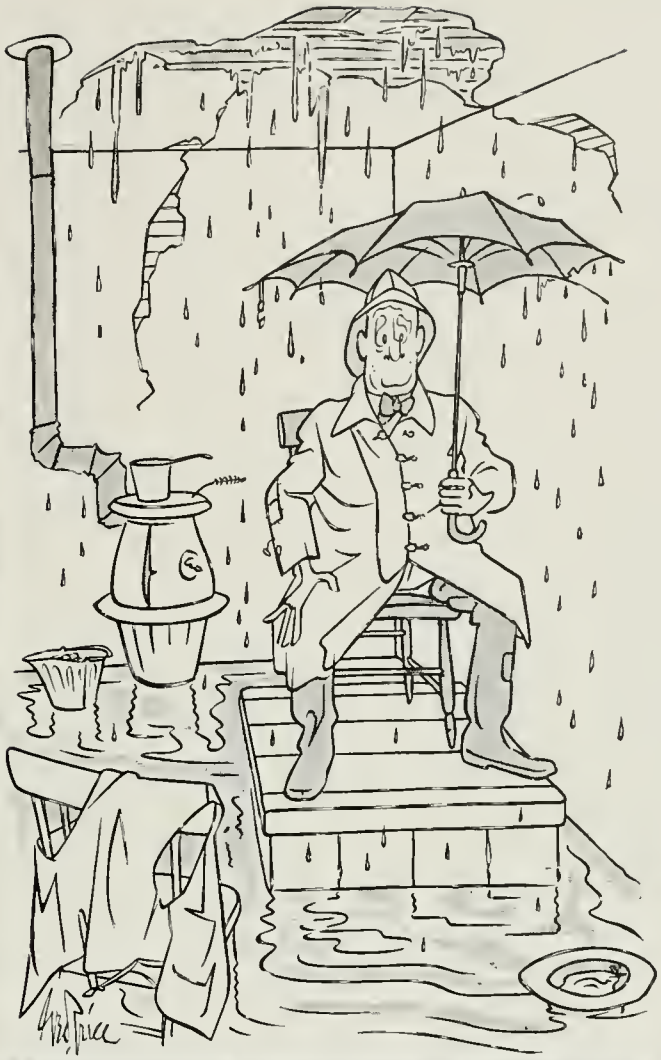
The University Concert and Entertainment Board has brought the very finest of cultural entertainment to the campus. To see and hear these great artists in metropolitan centers would probably cost several times the price for which they may be heard here. But this is the advantage of hearing music in an educational setup. Nor is the Star Course the only opportunity for the engineer to broaden his musical education. The University bands are noted as the world's finest, and the glee clubs, University chorus and orchestra enjoy growing popularity. Even participation in dance bands and "barber-shop quartets" bring musical experience of value. It is our sincere hope that you will expose yourself to the best in music. From your exposure will come understanding, and in music, and engineering, too, it's understanding that counts. The rewards of enjoyment are inevitable.

Roommate: "Hey Tom, wake up! There's a guy in here stealing your clothes!"

Second Roomie: "So what? You two just fight it out among yourselves."

inside it's always *raining*





• Yes, a continuous shower of tiny drops of oil inside this Tension Pulley Ball Bearing keeps balls and raceways automatically lubricated. It is the *first* anti-friction bearing with its own oil-circulating system—a permanent built-in feature, enabling it to run for a year or more without attention.

Since the products of New Departure are *ideas* as well as ball bearings, this company has developed many "famous firsts," has revolutionized mechanical design in many industries.

Nothing rolls like a ball. Ball bearings are used wherever shafts turn. Ask for your copy of that absorbing, superbly illustrated treatise: "Why Anti-Friction Bearings." New Departure, a division of General Motors, Bristol, Connecticut. Chicago and Detroit.

New Departure

. . THE FORGED STEEL BEARING

G-E Campus News

I KNOW!

IF THE steel for an automobile travelling between Chicago and Los Angeles at 60 mph was cold-rolled at a speed of 42 mph, how far is it from Bangor, Maine, to Bankok?

So far as we know there's no answer to this problem. But then, a few years ago there was no answer to the problem of cold-rolling steel strip at these speeds either.

G-E amplidyne control solved this problem, enabling a Pennsylvania steel plant, the largest, highest-powered cold-rolling mill for tin-mill products in the world, to roll out strip at speeds up to 3850 feet per second, or more than 43 miles per hour!

G-E motors to the tune of 11,400 hp respond to the precision control of G-E amplidyne circuits in driving the rolls of the mill at this speed.

TELEBOX

WHEN Dame Nature goes to work on a television antenna with rain, sleet, and snow, she can cause no end of transmission trouble.

G-E television engineers, however, circumvent weather changes by housing the antenna within an electrically heated box. This prevents seeping moisture from freezing on the antenna during cold weather and interfering with the normal patch of high-frequency current flow.

The antenna, at the top of a 128-foot transmitting tower in the heart of Schenectady, relays the picture waves to G.E.'s main transmitting station in the Helderberg hills 12 miles away.

On top of the box for relaying the accompanying FM sound is another antenna which also acts as a lightning rod to protect the tower and relay equipment.

RESEARCH INC.

HOW a heavy English bulldog and a brawny Irish washerwoman substantiated the findings of years of research is described with an order for fifty miles of Formex wire recently received by General Electric.

The customer was considering the use of Formex wire as a substitute for wire whose insulation had rotted after two or three years of use, exposing the bare copper. The railroad's signal engineer was "from Missouri" and wanted to see for himself whether Formex wire insulation could "take it."

Two 50-foot lengths were strung up. One was equipped with a metal ring, to which a bulldog was attached on a leash. The other became a washerwoman's clothesline. Several weeks later, after the bulldog had tugged against every inch of his wire and the washerwoman had pinched her wire with clothespins from end to end, the insulation of both lengths was still in perfect condition.